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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/493,080	01/28/2000	Ryoichi Kajiwara	503,38097x00	1760

20457 7590 07/16/2003

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[REDACTED] EXAMINER

CHAMBLISS, ALONZO

[REDACTED] ART UNIT

[REDACTED] PAPER NUMBER

2827

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/493,080	KAJIWARA ET AL.	
	Examiner	Art Unit	
	Alonzo Chambliss	2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
 THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 14 April 2003.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 13, 19, 20 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 20 and 25 is/are allowed.
- 6) Claim(s) 13 and 19 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 18 January 2000 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on 14 April 2003 is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

1. Amendment B filed on 4/14/03 has been fully considered and made of record in Paper No. 11.

Drawings

2. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 4/14/03 in Paper No. 12 have been approved by the examiner. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the metallic layer with a composite metal layer comprising a first and second precious metal layers must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Response to Arguments

4. Applicant's arguments with respect to claim 13, 19, 20, and 25 have been considered but are moot in view of the new ground(s) of rejection. The previous office action is withdrawn and this office action is made non-final.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasem et al. (U.S. 6,249,041) in view of Nakamura (JP 1-266752) and Osawa et al. (U.S. 6,077,727).

With respect to Claims 13 and 19, Kasem discloses a semiconductor substrate 12 (i.e. chip) and a semiconductor element which comprises the semiconductor substrate 12. Kasem discloses a semiconductor element attached to a first metallic member 26 (i.e. lead) and a second metallic member 32 (i.e. lead) by solder bumps in an alternative embodiment (see col. 4 lines 10-20; Figs.1A and 1B). Kasem does not

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explicitly disclose a first and second electrodes provided on a front and rear planes of the chip. However, since solder bumps are used in the alternate embodiment on the front and rear planes. It is well known in the semiconductor industry to connect Au solder bumps to Al electrode pads as evident by Nakamura (see Figs. 1-3). Thus, the first metallic member 26 is connected to the first electrode and a second metallic electrode 32 is connected to the second electrode. The second electrode is connected to the second metallic member 32 via a metallic layer (i.e. bumps). Kasem fails to disclose second electrode that is connected to the second metallic member via a metallic layer containing precious metal, wherein the metal layer is a composite metal layer comprised of a first precious metal layer provided at the front plane of the second electrode and a second precious metal layer adhered thereto by compression bonding provided at the front plane of the second metallic member. However, Osawa discloses an electrode 2 that is connected to the metallic member 14 via a metallic layer 23 containing precious metal, wherein the metal layer 23 is a composite metal layer comprised of a first precious metal layer 23a provided at the front plane of the electrode 2 and a second precious metal layer 23c adhered thereto by compression bonding provided at the front plane of the metallic member 14 (see col. 4 lines 37-67 and col. 5 lines 1-20; Figs. 4 and 5A-5E). Thus, at least 80% of an area of a respective Au/Al bonding region is contacting a Au bump, wherein the bonding region is made of an Au/Al alloy layer in the thickness direction. Therefore, it would have been obvious to incorporate the composite metal layer to the metallic member, since the composite

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metal layer would improve the electrical connection between the metallic member and a bump as taught by Osawa.

Allowable Subject Matter

7. Claims 20 and 25 are allowed.

The following is a statement of reasons for the indication of allowance subject matter: the prior art of record does not teach or suggest the combination of a semiconductor chip connected to a first, second, and third metallic member. The first metallic member is connected to a main current electrode, the second member is connected to a rear plane electrode, and the third member is connected to a control electrode on the front plane of the chip.

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

8. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

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Alonzo Chambliss
Patent Examiner
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